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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,919	08/18/2003	Dawn V. Muyres	58434US002	3648

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EXAMINER	
SUCH, MATTHEW W	

ART UNIT	PAPER NUMBER
2891	

NOTIFICATION DATE	DELIVERY MODE
12/26/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LegalUSDocketing@mmm.com
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Office Action Summary	Application No.	Applicant(s)	
	10/642,919	MUYRES ET AL.	
	Examiner	Art Unit	
	MATTHEW W. SUCH	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *12,27,29 and 30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-26,28 and 31-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 September 2008* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 2 September 2008. These drawings are unacceptable and objected to under 37 CFR 1.83(a)because they fail to show every feature of the invention specified in the claims. In fact, they appear to contradict some of the claimed subject matter. Specifically, the submitted drawings show the sealing material covering only semiconductor material and does not cover conducting lines on the integrated circuit (see claims 16-17, for example). The drawings also fail to show the aperature masks and methods of forming the transistor (see claim 18, for example). These features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

~~2.~~ The amendment filed 2 September 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

"An additional optional layer ~~of sealing material~~, such as a metal layer 36, can also be provided ~~for better barrier properties. Generally, metals provide excellent barrier properties. To prevent the TFT from shorting, however, it is necessary that the sealing layer 34 be between the metal layer 36 and the TFT~~."

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

3. Claims 11 and 31 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. The claim recites limitations which are already present in the previous claim. The only added word is "film", which adds no further structural limitation not already covered by the previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. In so far as definite, claims 1-6, 8, 11, 13-24, 28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harajiri (`246) in view of Shepherd (`739) in view of Pichler (`667).

Harajiri teaches at least a method of forming a thin film transistor by first providing a substrate (Fig. 1a; Col. 1, Line 14) and then, secondly, depositing a gate electrode (Element 1) on a substrate with a first mask (Col. 1, Line 14). Third, a gate dielectric (Element 3) is next formed on the gate electrode with a second mask (Col. 1, Lines 17-18). Fourth, a semiconductor layer (Element 4) is next formed on the gate dielectric with a third mask (Col. 1, Lines 19-21). Fifth, source/drain electrodes (Elements 5, 6) are next formed on the semiconductor with a fourth mask (Col. 1, Lines 21-23). A sealing material (Element 7) is deposited with a fifth mask (Col. 1, Lines 23-26). The thin film transistor is interconnected to other devices (such as Element 2 or other thin film transistors in an LCD display; Col. 1, Lines 5-12).

Harajiri is silent as to whether vacuum vapor deposition is done through the masks or if the vacuum vapor depositions are blanket deposits and the masks are used to pattern away unused portions of layers.

However, Shepherd teaches conventional vacuum vapor techniques of depositing through uniquely shaped sets of masks for forming thin film transistors (Col. 1, Lines 28-29). The thin film transistors can include a gate electrode (Element 14a), a gate dielectric (Element 18a), a semiconductor (Element 20), source/drains (Elements 24, 26), a sealing film (Element 18b), and a "metal layer" (Element 14b).

Regarding claims 1-2, 11, 14, 18-22, 28 and 31, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the gate electrode, dielectric, semiconductor, source/drains, and sealing film by vacuum vapor deposition through each of the five masks. One would have been motivated to do so since Shepherd teaches that this process has specific advantages (especially over blanket deposition and patterning) such as maintaining clean interfaces, producing a transistor with better performance, since all depositions are completed in a single vacuum cycle without breaking vacuum (Col. 1, Lines 30-40).

Harajiri is also silent regarding the masks being flexible polymeric aperture masks.

However, Pichler teaches fabricating organic electronic devices, including transistors (Col. 4, Lines 58-60), using a polymeric film aperture mask forming a pattern of sealing material in the pattern of the aperture mask (Element 510; Col. 7, Lines 57-68; Col. 8, Lines 18-28; Col. 11, Lines 12-30, for example). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a polymeric film aperture mask since such a mask allows for selective deposition, is removable, and is reusable as a multi-use mask (Col. 7, Lines 57-68; Col. 8, Lines 29-49, for example).

Regarding the phrase "wherein said aperture mask is reusable and repositionable", the examiner notes that the claim does not actually require that the aperture mask is reused and repositioned. As such, this language is merely a motivational statement for the polymeric aperture mask. Therefore, since the prior art mask is capable of being reusable and repositionable, the polymeric mask of Pichler meets the claim.

Regarding claims 3-8, 13 and 23-24, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the "metal layer" on the sealing layer by the aperture mask in order to form a double gate structure (Shepherd Col. 4, Line 46). It would have been obvious to form the sealing layer of silicon oxide or aluminum oxide, which are transparent and have electrical resistivity of 1E6 ohm-cm (greater than 100x of semiconductor resistivity) since Shepherd teaches that these are conventional gate dielectric materials (Col. 2, Line 60; Col. 4, Lines 65-66). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. Additionally, the materials such as silicon oxide or aluminum oxide provide an excellent barrier to oxygen and moisture (Pichler Col. 6, Lines 18-23, for example).

Regarding claims 15-17, it would have been obvious to one of ordinary skill in the art at the time the invention was made to cover more than just the one transistor, but also conductive lines and additional transistors on the substrate since Pichler teaches that allowing the sealing material to be larger than merely the active areas of the device helps

to produce a smooth layer, less likely to break (Col. 6, Lines 40-55) as well as to form a better bond by being in contact with the substrate itself (Col. 10, Lines 60-65).

6. In so far as definite, claims 9-10 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harajiri (`246) in view of Shepherd (`739) in view of Pichler (`667) as applied to claims 1 and 18 above, and further in view of Gundlach (IEEE, Vol. 18; supplied with Office Action dated 2 May 2008).

Harajiri in view of Shepherd does not teach pentacene as the semiconductor material, but rather, teaches using conventional inorganic semiconductor materials such as silicon or CdSe.

Gundlach teaches forming transistors with pentacene as a semiconductor material in thin film transistors. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use pentacene in place of conventional inorganic semiconductor materials. One would have been motivated to do so since Gundlach teaches that organic pentacene semiconductor materials have comparable performance with inorganic semiconductors while have advantages such as the use of inexpensive, lightweight, flexible, and mechanically rugged materials for substrates ("I. Introduction").

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harajiri (`246) in view of Shepherd (`739) in view of Pichler (`667) as applied to claims 1 and 18 above, and further in view of Bearinger (`987).

Harajiri does not teach conventional sealing materials useful for electronics.

However, Bearinger teaches a variety of conventional sealing materials including inorganic oxides, metal oxides, silicon compounds, diamond-like coatings, and polymers such as parylene (Abstract; Col. 1, Lines 50-57; Col. 9, Lines 13-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use parylene as sealing layer of Harajiri since Bearinger teaches parylene provides for water repellency, a smooth surface and resistance to erosion and delamination (Col. 1, Lines 55-57). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

8. Claims 32-34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harajiri (`246) in view of Shepherd (`739) in view of Pichler (`667) as applied to claim 11 above, and further in view of Himeshima (`469).

Pichler teaches some conventional materials, such as PTFE and polysiloxanes useful for the polymeric aperture mask, but does not teach polyimide. Pichler also does not teach conventional useful thicknesses for the polymeric aperture mask.

However, Himeshima teaches configurations of conventional polymeric aperture masks, including polyimide material (Para. 0099) and a thickness of 25 microns (Para. 0112), for example. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use polyimide as the polymeric aperture mask material since it is a flexible material that is also photosensitive, aiding in manufacturing of the

mask (Para. 0099). It has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the mask thickness about 25 microns, since such a thickness helps avoid difficulties in producing thick masks (Para. 0096, 0112). It has been held that where the general conditions of a claim are disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

9. Applicant's arguments with respect to claims 1-11, 13-26, 28 and 31-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Gerlach (`519) and Kubota (`708) each teach using shadow masks for producing sealing layers on organic electronic devices.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW W. SUCH whose telephone number is (571)272-8895. The examiner can normally be reached on Monday - Friday 9AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew W. Such
Examiner, Art Unit 2891

MWS
12/19/08

/Douglas M Menz/
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12/21/08